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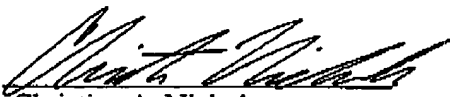
Group Art Unit: 2172

Title: TECHNIQUES FOR DLM OPTIMIZATION WITH TRANSFERRING LOCK INFORMATION

INFORMAL PROPOSED AMENDMENT

Sir:

Applicant proposes the following amendments to the claims of the above-referenced application. It is respectfully submitted that the following amended claims are allowable over the cited references. Please call the Applicant's attorney, Christian Nicholes, at (408)414-1224, to discuss whether the proposed amended claims are allowable.

Respectfully submitted,

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By _____
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1.   (Currently Amended) A method for re-distributing, over a cluster of one or more active

nodes, management of locks on shared resources, the method comprising:

establishing a first master node as master for one or more resources in response to a

hash value range being mapped to said first master node, wherein the hash value

range is associated with said one or more resources by a hash function;

transferring responsibility for mastering said one or more resources from the first

master node to a second master node during a transfer time interval;

during the transfer time interval, a receiving node receiving new lock requests, wherein

said receiving node is one of the first master node and the second master node;

~~and~~

during the transfer time interval, processing the new lock requests;

re-mapping the hash value range to the second master node at the first master node; and

sending initial lock information resident on the first master node at a start of the

transfer time interval to the second master node;

wherein transfer of locks from the first master node to the second master node begins at

a first point in time;

wherein the transfer of locks from the first master node to the second master node ends

at a second point in time;

wherein the transfer time interval begins at the first point in time and ends at the second

point in time; and

wherein other active nodes in the cluster acknowledge that said other active nodes have

been informed that said second master node is assuming responsibility for

mastering said one or more resources.

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2.   (Canceled)

3.   (Currently Amended) The method of ~~Claim 2~~Claim 1, said transferring further comprising, in response to receiving acknowledgements from all active nodes in the cluster by a full acknowledgement time, sending updated lock information resident on the first master node at said full acknowledgment time to the second master node, wherein the transfer time interval ends at an update time of said sending updated lock information.

4.   (Original) The method of Claim 1, said transferring further comprising:

receiving initial lock information at the second master node, said initial lock
      information resident on the first master node at a start of the transfer time
      interval;

re-mapping the hash value range to the second master node at the second master node;
      and

sending a broadcast message to all other nodes in the cluster that the second master
      node is a new master node for resources associated with the hash value range.

5.   (Previously Presented) A method for re-distributing, over a cluster of one or more active nodes, management of locks on shared resources, the method comprising:

establishing a first master node as master for one or more resources in response to a
      hash value range being mapped to said first master node, wherein the hash value
      range is associated with said one or more resources by a hash function;

transferring responsibility for mastering said one or more resources from the first
      master node to a second master node during a transfer time interval; and

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processing lock requests received at a receiving node of the first master node and the

second master node by the receiving node during the transfer time interval, said

transferring further comprising:

receiving a broadcast message at a set of nodes in the cluster, the set of nodes including

all nodes in the cluster except the first master node and the second master node;

wherein the broadcast message indicates that the second master node is a new master

node for resources associated with the hash value range;

re-mapping the hash value range to the second master node at each node in said set of

nodes in the cluster;

sending an acknowledgment to the first master node from each node in said set of nodes

in response to the broadcast message, said acknowledgement indicating that said

each node in said set of nodes has been informed that said second master node is

assuming responsibility for mastering said one or more resources; and

after sending the acknowledgement, said each node in said set of nodes sending

subsequent lock requests for resources associated with the hash value range to

the second master node.

6. (Original) The method of Claim 4, said transferring further comprising receiving

updated lock information from the first master node at the second master node wherein

the transfer time interval ends at an update time of said receiving updated lock

information.

7. (Original) The method of Claim 6, wherein:

lock requests include a sequence number; and

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said method further comprises deleting stale requests among the updated lock

information received at the second master node, the stale requests indicated by

sequence numbers earlier than sequence numbers in lock requests already

processed on the second master node.

8-14.   (Canceled).

15.   (Original) A computer-readable medium bearing instructions for re-distributing, over a

cluster of one or more active nodes, management of locks on shared resources from a

first master node to a second master node during a transfer time interval, the

instructions arranged to cause one or more processors on the first master node to

perform:

re-mapping a hash value range initially assigned to the first master node to the second

master node, wherein the hash value range is associated with one or more of the

shared resources by a hash function;

sending initial lock information resident on the first master node at a start of the

transfer time interval to the second master node;

receiving acknowledgments at the first master node from other active nodes in the

cluster; said acknowledgements indicating that said other active nodes have

been informed that said second master node is assuming responsibility for

mastering said one or more resources.

16.   (Original) The computer-readable medium of Claim 15, said instructions further

causing the one or more processors to perform, in response to receiving

acknowledgements from all active nodes in the cluster by a full acknowledgement time,

sending updated lock information resident on the first master node at said full

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acknowledgment time to the second master node, wherein the transfer time interval ends at an update time of said sending updated lock information.

17. (Original) The computer-readable medium of Claim 15, said instructions further causing the one or more processors to perform processing lock requests received during the transfer time interval until receiving acknowledgements from all active nodes in the cluster.

18. (Currently Amended) A computer-readable medium bearing instructions for re-distributing, over a cluster of one or more active nodes, management of locks on shared resources from a first master node to a second master node during a transfer time interval, the instructions arranged to cause one or more processors on the second master node to perform:

receiving initial lock information resident on the first master node at a start of the transfer time interval;

re-mapping a hash value range initially assigned to the first master node to the second master node, wherein the hash value range is associated with one or more of the shared resources by a hash function; and

sending a broadcast message to all other nodes in the cluster that the second master node is a new master node for resources associated with the hash value range; wherein other active nodes in the cluster acknowledge that said other active nodes have been informed that said second master node is assuming responsibility for mastering said one or more resources.

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19. (Original) The computer-readable medium of Claim 18, said instructions further causing the one or more processors to perform receiving updated lock information from the first master node wherein the transfer time interval ends at an update time of said receiving updated lock information.

20. (Original) The computer-readable medium of Claim 19, wherein:

lock requests include a sequence number; and

said instructions further cause the one or more processors to perform deleting stale requests among the updated lock information received at the second master node, the stale requests indicated by sequence numbers earlier than sequence numbers in lock requests already processed on the second master node.

21. (Original) A computer-readable medium bearing instructions for re-distributing, over a cluster of one or more active nodes, management of locks on shared resources from a first master node to a second master node during a transfer time interval, the instructions arranged to cause one or more processors on a third node to perform:

receiving a broadcast message indicating that the second master node is a new master node for resources associated with a hash value range, wherein the hash value range is associated with one or more of the shared resources by a hash function;

re-mapping the hash value range to the second master node;

sending an acknowledgment to the first master node in response to the broadcast message, said acknowledgement indicating that said third node has been informed that said second master node is assuming responsibility for mastering said one or more resources; and

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after said sending an acknowledgment, sending subsequent lock requests for the one or more of the shared resources to the second master node.

22. (New) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 1.

23. (New) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 2.

24. (New) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 3.

25. (New) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 4.

26. (New) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 5.

27. (New) A computer-readable medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 6.

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28.   (New) A computer-readable medium carrying one or more sequences of

instructions which, when executed by one or more processors, causes the one or

more processors to perform the method recited in Claim 7.

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☒ URGENT   ☐ FOR REVIEW   ☐ PLEASE COMMENT   ☐ PLEASE REPLY   ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Attached please find the Informal Proposed Amendment.

Christian Nicholes